

# The Occurrence of *Spastonyx macswaini* in California, and a Description of its First Instar Larva<sup>1</sup>

(Coleoptera: Meloidae)

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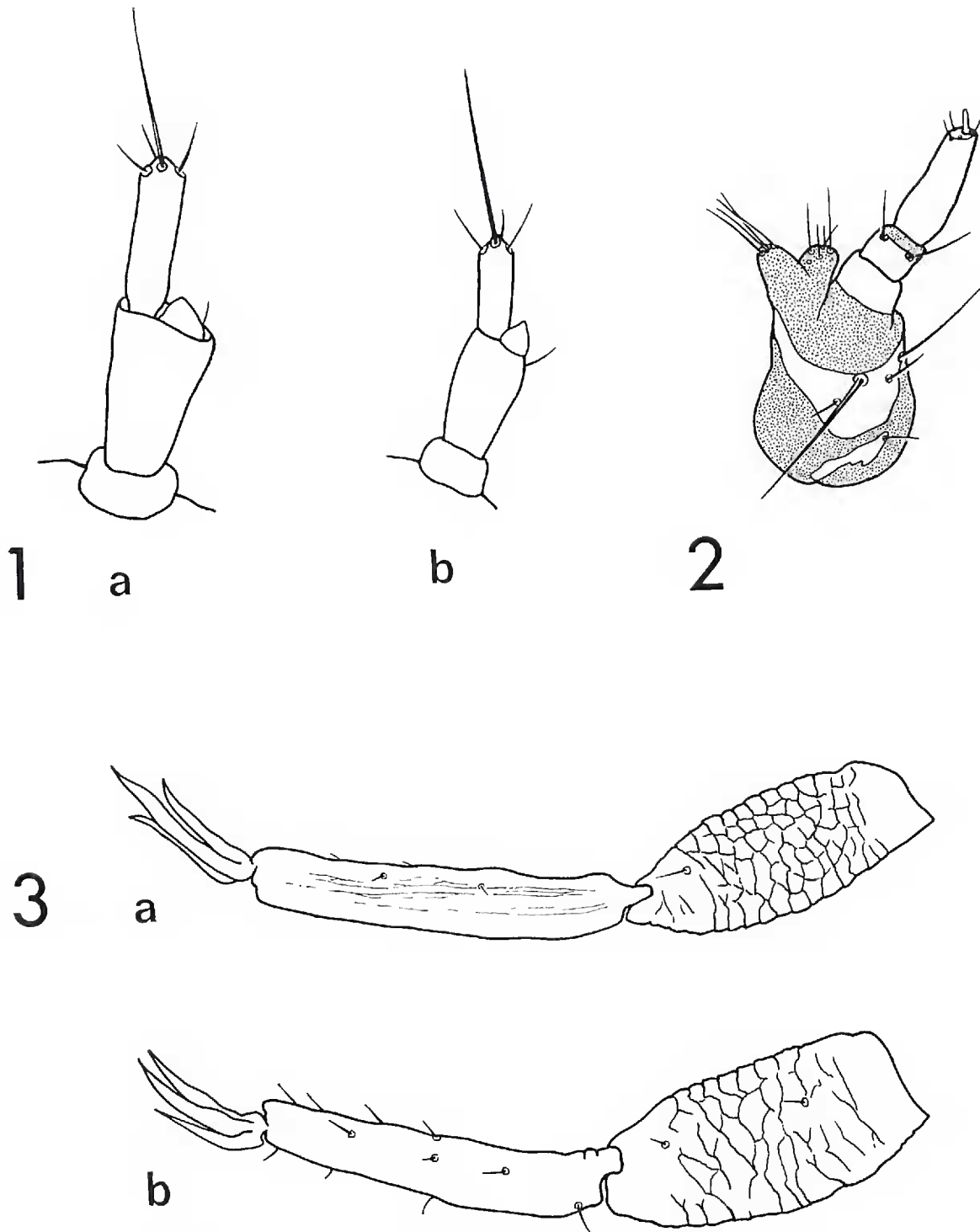
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*Spastonyx* Selander is a small and rather obscure North American genus of Meloidae. Its two included species, *S. nemognathoides* (Horn) and *S. macswaini* (Selander), originally comprised a subgenus of *Eupompha* LeConte (= *Calospasta* LeConte) (see Selander, 1954) but were recently removed from the *Eupomphina* and transferred to the Meloini (Pinto and Selander, 1970). *S. nemognathoides* is the commoner of the two species. First described from the Owens Valley, it occurs in early spring in the desert areas of SE California and SW Arizona. Adults are frequently found feeding on flowers of *Sphaeralcea* spp. and *Dalea schottii* Torrey. *S. macswaini*, one of the rarest of North American meloids, has been known solely from its type series collected in 1940 at Yuma, Arizona. A second locality has now been found adjacent to the International Boundary in Imperial County, California, ca. 12 mi W Calexico. This site is within a dry wash ca. 1 mi W of the West Side Main Canal and directly north of Signal Mountain. The area is dominated by typical Colorado Desert perennials, namely *Larrea divaricata* Cavanilles (creosote bush), *Ambrosia dumosa* (Gray) (burro-weed), and *Fouquieria splendens* Engelmann (ocotillo). Approximately 75 adults of *S. macswaini* have been observed or collected at this locality on three occasions (4 April 1970, 15 April 1973, and 16 April 1974). All specimens were associated with *Coldenia palmeri* Gray (Boraginaceae). Beetles were commonly observed feeding on the flowers of this plant both in the field and in the laboratory.

*Coldenia palmeri* is a common perennial throughout much of the Colorado Desert, and *S. macswaini* is probably more widespread than collections indicate. Small size ( $\bar{x}$  body length = 4.0, range = 3.5–5.5 mm), extreme wariness, and relatively low numbers probably account, in part, for the rarity of this meloid. Beetles are particularly difficult to detect because they confine much of their activity to stems beneath the dense peripheral foliage of their host. Moreover, *C. palmeri* is a relatively brittle and low-growing plant which is not readily swept nor beaten.

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FIGS. 1-3. First instar larvae of *Spastonyx*. Fig. 1. Antennae (ventral view): a, *S. nemognathoides*; b, *S. macswaini*. Fig. 2. Maxilla of *S. macswaini* (ventral view). Fig. 3. Forelegs: a, *S. nemognathoides*; b, *S. macswaini*.

*First Instar Larvae.* The first instar larva of *S. nemognathoides* was described and illustrated by Pinto and Selander (1970). It was because of the striking structural and behavioral similarities of this larva to those of *Meloe* Linnaeus that *Spastonyx* was transferred to the Meloini. The genus had previously been allied to the Eupomphina solely on the basis of adult claw structure (Selander, 1954). Other adult

TABLE 1. Comparative anatomy of the first instar larvae of *Spastonyx*<sup>a</sup>.

Characters	<i>S. nemognathoides</i>	<i>S. macswaini</i>
Color	entirely light golden brown	weakly bicolored; head light yellow brown, rest of body light brown; femora slightly darker and abdominal sternites lighter than other sclerous areas.
Head Capsule		
a. Ratio of length to width	.81 $\pm$ .02 (.77–.82)	.86 $\pm$ .01 (.83–.89)
Antennae (Fig. 1)		
a. Segment I	relatively short, ratio of length to that of segment II = .23 $\pm$ .01 (.22–.25)	longer, ratio of length to that of segment II = .32 $\pm$ .01 (.32–.35)
b. Segment II	relatively wide apically, maximal width to length ratio = .61 $\pm$ .01 (.59–.64)	not as wide apically, maximal width to length ratio = .55 $\pm$ .01 (.53–.59)
c. Sensory cone	asymmetrical, distinctly wider than long	symmetrical, as long as or slightly longer than wide
d. Terminal seta	length subequal to that of segment III	ca. 15% longer than segment III
Maxillary palpi		
a. Segment I	relatively short, ratio of length to that of segment II = .69 $\pm$ .01 (.67–.73)	distinctly longer, ratio of length to that of segment II = .96 $\pm$ .01 (.90–1.00)
Labial palpi		
a. Length	relatively long, only 30–40% shorter than segment III of maxillary palpi	ca. 60% shorter than segment III of maxillary palpi
b. Ratio of length of segment I to II	.63 $\pm$ .03 (.56–.67)	.44 $\pm$ .02 (.40–.50)

<sup>a</sup> Quantitative data consists of the mean  $\pm$  SE followed by the range. Measurements are based on six slide mounted specimens of each species.

TABLE 1. Continued.

Characters	<i>S. nemognathoides</i>	<i>S. macswaini</i>
Fore leg <sup>b</sup> (Fig. 3)		
a. Tibia	width homogeneous throughout; distinctly longer than femur; ratio of femoral to tibial length = $.85 \pm .01$ (.83–.87)	narrowing somewhat apically; only slightly longer than femur; ratio of femoral to tibial length = $.96 \pm .01$ (.92–1.00)
b. Tibial setae	their length much less than $\frac{1}{2}$ tibial width	their length subequal to $\frac{1}{2}$ minimal tibial width
Abdomen		
a. Sternite I	narrowly divided medially	entire
Body Length (mm)	$1.83 \pm .01$ (1.80–1.85)	$1.55 \pm .04$ (1.42–1.62)

<sup>b</sup> These differences hold for all three pairs of legs.

anatomical traits, and courtship behavior in *S. nemognathoides* are, unfortunately, of little help in suggesting affinity (Pinto and Selander, 1970).

The first instar larva of *S. macswaini* is very similar to that of *S. nemognathoides* and the genus can now be characterized as follows:<sup>2</sup>

Head with basal elevation absent; arms of epicranial suture nearly complete to base of antennae; clypeus fused to frons; labrum invisible from above. Antennae with a small, hyaline, conical sensory organ at apex of segment III (Fig. 1). Mandibles not extending beyond anterior margin of head when adducted, internal surface entire. Maxillae with mala bifid (Fig. 2). Labial palpi two segmented. Legs robust; tarsunguli and basal setae spathulate (Fig. 3), basal setae darker than tarsungulus. Abdomen with first spiracle subequal in diameter to that of mesothorax, other spiracles markedly smaller. Sternites II–IX complete; protrusible anal appendage visible in living specimens; apex bearing two caudal setae, their length about  $\frac{1}{2}$  that of abdomen.

As mentioned by Pinto and Selander (1970), the larvae of *Spastonyx* are especially similar to those of the nominate subgenus of *Meloe*, and, in fact, the latter shares more features with *Spastonyx* than with other subgenera. The species of *Spastonyx*, however, can easily be separated from nominate *Meloe* in that they lack a transverse basal elevation on the head capsule, have two rather than four caudal setae, and possess a

<sup>2</sup> The terminology employed in the larval descriptions closely follows that of MacSwain (1956).

bifid maxillary mala. The latter trait is unique to *Spastonyx*, being entirely unknown in other meloids.

The possibility that the remarkable similarity between *Meloe* and *Spastonyx* larvae is due to convergence generated by a common life history cannot be entirely discounted at this time. The first instar larvae of all species of *Meloe*, as far as is known, crawl onto vegetation and attach to their host bee as it visits flowers. Phoretic behavior has not been documented for any other genus of Meloidae but the trident-like claw structure, the protrusible anal appendage, and the use of these in maneuvering on smooth vertical surfaces (as in *Meloe*) strongly suggest phoresy in *Spastonyx* as well.

Features distinguishing *S. macswaini* from *S. nemognathoides* are detailed in Table 1. Traits which best separate the two species are tibial length, length of the tibial setae, shape of the antennal sensory cone, and length of the first segment of the maxillary palpi.

The description of *S. macswaini* (Table 1) is based on larvae from a mass of 25 eggs laid and hatching on 7 and 25 April 1970, respectively; and from a mass of 27 eggs laid and hatching on 18 and 26 April 1973, respectively (at 27°C). Larvae of *S. nemognathoides* used for comparison are from eggs laid by females collected at Theba, Maricopa County, Arizona; and at Deep Canyon, 4 mi S Palm Desert, Riverside County, California.

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